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11 FEB 2002

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SRF-5J
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Chicago, Illinois 606090

DOE-0275-02

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Ms. Val Orr
Division of Drinking and Ground Waters – UIC Unit
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, OH 43216-1049

Dear Mr. Saric, Mr. Schneider and Ms. Orr:

NOVEMBER 2001 MONTHLY RE-INJECTION OPERATING REPORT

This letter submits the subject report for your review and approval.

This monthly report is being submitted to the United States Environmental Protection Agency and Ohio Environmental Protection Agency Office of Federal Facilities Oversight in accordance with the Re-Injection Demonstration Test Plan. The monthly report is also being submitted to the Ohio Environmental Protection Agency Division of Drinking and Ground Waters Unit of Underground Injection Control (UIC) in accordance with their guidelines.

11 FEB 2002

Mr. James A. Saric
Mr. Tom Schneider
Ms. Val Orr

DOE-0275-02

If you have any questions or concerns regarding this report, please contact Robert Janke at (513) 648-3124.

Sincerely,

Johnny Reising

FEMP:R.J. Janke

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosure: As Stated

cc w/enclosure:
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T. Schneider, OEPA-Dayton (three copies of enclosure)
F. Bell, ATSDR
F. Hodge, Tetra Tech
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
D. Brettschneider, Fluor Fernald, Inc./MS52-5
K. Broberg, Fluor Fernald, Inc./MS52-5
W. Hertel, Fluor Fernald, Inc./MS52-5
M. Jewett, Fluor Fernald, Inc./MS52-2
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MONTHLY RE-INJECTION OPERATING REPORT NOVEMBER 2001

OVERVIEW

On September 2, 1999, DOE completed one year of active groundwater re-injection as part of a field-scale demonstration. A report detailing the demonstration was issued to the U.S. EPA and Ohio EPA on May 30, 2000.

Re-Injection at Fernald is exempted under 40 CFR 300.400(e)(1) from requiring a permit, as it is a CERCLA action. In accordance with Ohio EPA Guidelines (OEPA 1997), DOE will prepare monthly operating reports that include:

I. An analysis of the injectate
II. The volume and rate of re-injection
III. A description of any well maintenance and rehabilitation procedures conducted.

DOE submits the monthly re-injection operating reports to the U.S. EPA, Ohio EPA Office of Federal Facilities Oversight, and the Division of Ohio EPA Drinking and Ground Waters – Underground Injection Control Unit. This report covers re-injection operations from November 1 to December 1, 2001.

Routine monitoring of the aquifer in the re-injection area is conducted as part of the groundwater remedy performance monitoring program specified in Fernald's Integrated Environmental Monitoring Plan. Results of the Integrated Environmental Monitoring Plan are reported quarterly and are available for viewing on the Fernald Website, www.fernald.gov.

ANALYSIS OF THE INJECTATE

Groundwater extracted from the Great Miami Aquifer is treated for uranium removal and is then re-injected into the Great Miami Aquifer. The groundwater is treated in the FEMP Advanced Waste Water Treatment (AWWT) Expansion Facility. The effluent from the AWWT Expansion Facility is sampled monthly for the parameters listed in Table 2-1 of the Re-Injection Demonstration Test Plan, Revision 0.

Monthly injectate grab sampling focuses on the groundwater final remediation level (FRL) constituents that have had an exceedance of their FRL in the region of the aquifer from which the groundwater is being pumped. The monthly injectate grab samples are sent to an off-site laboratory for analysis. In addition to the monthly grab sample, 24 hour composite samples are collected and analyzed at the on-site laboratory for total uranium. The 24 hour composite sampler samples the combined effluent from the

active treatment trains comprising the facility. The daily composite results are used by plant management for making process control decisions. They provide a daily evaluation of the quality of the water that is re-injected into the aquifer. Composite daily total uranium results from the AWWT Expansion Facility effluent for days when re-injection occurred are shown in Figure 1.

The monthly grab sample was collected on November 27, 2001. However, metals and nitrate analyses are not available; incorrect preservative was placed in the sample bottles for these analytes. Therefore, limited results are provided in Table 1. These results indicate that for the results obtained, no FRLs were exceeded. The total uranium concentration measured in the monthly grab sample was 7.53 micrograms per liter (µg/L). Due to the total uranium Maximum Contaminant Level (MCL), the new FRL for total uranium is now 30 µg/L. U.S. EPA approved use of the new total uranium FRL at Fernald on November 30, 2001 in a letter to DOE. This letter accepted DOE's Explanation of Significant Differences (ESD) outlining changes to the Operable Unit 5 Record of Decision for the groundwater FRL for total uranium.. The total uranium concentration of the daily composite sample also collected on November 27, 2001 was 8.4 µg/L.

VOLUME AND RATE OF RE-INJECTION

The design re-injection set point for each of the re-injection wells is 200 gallons per minute (gpm). The combined design re-injection rate for all five wells is 1000 gpm. Figure 2 illustrates the location of the five re-injection wells; Tables 2 through 6 summarize the current calendar year's operational data by month. The tables also provide averages by year for the calendar years 1998, 1999, and 2000. Re-Injection Well 8 is 8 inches in diameter. Re-Injection Well 9 is 12 inches in diameter. The other re-injection wells are all 16 inches in diameter.

In February 2000, a new injection rate strategy was initiated to help compensate for well downtimes due to maintenance, electrical outages, etc. Re-injection rate set points may be temporarily increased to 220 gpm toward the end of a month and decreased to the 200 gpm rate at the start of a new month. The ability to increase re-injection rates is dependent upon the condition of the wells, availability of higher than average groundwater treatment capacity, and lower than normal uranium concentrations in the site effluent. This strategy for adjusting re-injection rate set points may continue in future months, depending on the variables noted above.

Figure 3 illustrates the water level rise in each of the operating re-injection wells from November 1 to December 1, 2001, as recorded by the operators at the AWWT Expansion Facility Distributed Control System (DCS). Water levels are recorded three times each day. Water levels inside the re-injection wells are monitored as an indicator of plugging within the wells. Given a constant re-injection rate, as a

well becomes plugged, the water level in the well rises to compensate for the greater pressure needed to move the same volume of water through a smaller opening.

While it is not the intent of this report to discuss operational issues, the following information is provided to aid in the interpretation of Figures 1 and 3.

SUMMARY OF SYSTEM OUTAGES FOR THE REPORTING PERIOD

For the month of November 2001, re-injection took place at a reduced rate due to outages. Re-Injection Well 8 was down the entire month. Re-Injection Well 9 was down until rehabilitation was completed on November 29, 2001. As reflected in Figure 1, the remaining three operative wells (Re-Injection Wells 10, 11, and 12) were down from November 4 until November 13, 2001 and from November 15 until November 21, 2001 for the following reasons:

- Re-Injection Wells 10, 11, and 12 were shut down at 04:35 on November 4, 2001 for construction tie-in of new wells to the AWWT Expansion system. However, when an attempt was made on November 7th to restart the system, the system shut itself down due to high pressure differential in the system's final polishing strainers. The system remained shut down for an extended period to address resin leaking from the AWWT Expansion system. The subsequent investigation determined that one of the bottom strainers in the Train 1 Vessel 1A had become disconnected. The wells were restarted on November 13, 2001 at 08:35 but were taken offline on November 15, 2001 at 08:55 due to high total uranium concentration in the expansion discharge (i.e., > 10 µg/L). The wells were placed back online on November 21, 2001 at 10:20 after the total uranium results from the AWWT Expansion system were confirmed to be below 10 µg/L.

SUMMARY OF WELL MAINTENANCE FOR THE REPORTING PERIOD

- Treatment of Re-Injection Well 9 was completed the week of November 12, 2001. Based on the well's specific pumping capacity, the treatments did not appear to have removed the plugging to a degree which will provide for a reasonable operating time before another rehabilitation treatment is required. Alternatives for this well are being discussed.
- Re-Injection Well 9 came back online on November 29, 2001 at 15:50 at a rate of 150 gpm.
- Treatment of Re-Injection Well 8 was completed with post-treatment chlorination during the week of November 26, 2001. Re-Injection Well 8 is scheduled to come back on line in early December after the post-treatment samples are collected.

NOTIFICATION OF SIGNIFICANT REDUCTION IN RE-INJECTION EFFICIENCY

The re-injection wells have been subject to increased residual plugging that had effectively stopped re-injection at Re-Injection Wells 8 and 9. The cessation of re-injection in these wells resulted in an overall well field reduction to 60 percent of the design rate at the beginning of the reporting period, resulting in a re-injection rate of 600 gpm. By the end of the reporting period, however, Re-Injection Well 9 was rehabilitated and the system was re-injecting at 750 gpm.

More information, including information beyond the temporal scope of this report (e.g., more recent than November 2001), will be presented in the weekly site conference calls as it becomes available.

TABLE 1

ANALYSIS OF INJECTATE
Sample Collected November 27, 2001

Constituents[a]	Result[b, c]	Groundwater FRL[e]	Detection Limit	Constituent Type[g]	Basis for FRL[h]
General Chemistry		mg/L			
Nitrate	NA	11.0		MP	B
Inorganics		mg/L			
Antimony	NA	0.006		N	A
Arsenic	NA	0.05		N	A
Barium	NA	2.0		N	A
Beryllium	NA	0.004		N	A
Cadmium	NA	0.014		N	B
Total Chromium	NA	0.022[f]		MP	R
Cobalt	NA	0.17		N	R
Lead	NA	0.015		N	A
Manganese	NA	0.9		N	B
Mercury	NA	0.002		MP	A
Nickel	NA	0.1		N	A
Selenium	NA	0.05		N	A
Silver	NA	0.05		N	R
Vanadium	NA	0.038		N	R
Zinc	NA	0.021		N	B
Radionuclides		pCi/L			
Neptunium-237	U	1.0	0.00	MP	R*
Radium-226	0.575	20.0		N	A
Strontium-90	U	8.0	0.131	MP	A
Thorium-228	U	4.0	-0.00411	N	R*
Thorium-232	U	1.2	-0.00326	N	R*
		µg/L			
Total Uranium	7.53	30.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	4 JB[d]	6.0		N	A
Carbon disulfide	0.5 J[d]	5.5		N	A
1, 1-Dichloroethene	U	7.0	1.0	N	A
1, 2-Dichloroethane	U	5.0	1.0	MP	A
Trichloroethene	U	5.0	1.0	N	A

[a]Constituents taken from Table 2-1 of Re-Injection Demonstration Test Plan. Constituents are those previously detected in aquifer zones 2 and 4 at concentrations above their FRL.

[b]If a duplicate sample was analyzed the highest concentration between the regular sample and duplicate sample is reported.
U = Nondetect

[c]Metals and nitrate analyses are not available (NA); incorrect preservative was placed in the sample bottles for these analytes.

[d]J = Lab qualifier. Reported result is positively detected but is estimated; the result is still usable for making decisions.
B = Lab qualifier. Reported result is greater than the instrument detection level but less than the contract required detection limit.

[e]From Table 9-4 in OU5 ROD.

[f]FRL is for hexavalent chromium.

[g]Constituent types from Appendix A of IEMP. MP indicates that the constituent has been identified as being able to migrate to the aquifer. N indicates that the constituent has been identified as not being able to migrate to the aquifer.

[h]A - Applicable or relevant and appropriate requirement based (MCL, PMCL, etc.).
B - Based on 95th percentile background concentrations.
R - Risk-based
R* - Risk-based radionuclide cleanup levels include constituent specific 95th percentile background concentration.

TABLE 2

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RE-INJECTION WELL 22107 (IW-8)
OPERATIONAL SUMMARY SHEET
NOVEMBER 2001

Reference Elevation (feet AMSL) - 539.92 (top of casing)
Northing Coordinate ('83) - 476196.22
Easting Coordinate ('83) - 1347978.25

Hours in reporting period[a] = 720.00
Hours not injecting[b] = 720.00
Hours injecting[c] = 0.00
Operational percent[d] = 0.0

Target Injection Rate = 200 gpm

	Monthly Measurements	
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.04	207
1999	7.21	199
2000	4.26	149
1/01	0.00	0
2/01	0.00	0
3/01	0.00	0
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0
8/01	0.00	0
9/01	0.00	0
10/01	0.00	0
11/01	0.00	0

[a]First operational shift reading on November 1, 2001 to first operational shift reading on December 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

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TABLE 3

RE-INJECTION WELL 22108 (IW-9)
OPERATIONAL SUMMARY SHEET
NOVEMBER 2001

Reference Elevation (feet AMSL) - 578.025 (top of casing)
Northing Coordinate ('83) - 476255.74
Easting Coordinate ('83) - 1348384.49

Hours in reporting period[a] = 713.30
Hours not injecting[b] = 660.00
Hours injecting[c] = 53.30
Operational percent[d] = 7.47

Target Injection Rate = 150[g] gpm

	Monthly Measurements	
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[h]
1998	7.67	204
1999	6.64	188
2000	4.29	164
1/01	0.00	0
2/01	0.00	0
3/01	0.11	204
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0
8/01	0.00	0
9/01	0.00	0
10/01	0.00	0
11/01	0.48	149

[a]First operational shift reading on November 1, 2001 to first operational shift reading on December 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]For November 2001, the target re-injection rate was 150 gpm.
[h]Gallons Injected/(Hours Injecting x 60)

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TABLE 4

RE-INJECTION WELL 22109 (IW-10)
OPERATIONAL SUMMARY SHEET
NOVEMBER 2001

Reference Elevation (feet AMSL) - 576.92 (top of casing)
Northing Coordinate ('83) - 476175.65
Easting Coordinate ('83) - 1348860.53

Hours in reporting period[a] = 721.10
Hours not injecting[b] = 388.00
Hours injecting[c] = 333.10
Operational percent[d] = 46.19

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.66	204
1999	7.07	196
2000	3.96	149
1/01	2.72	206
2/01	6.27	199
3/01	7.82	200
4/01	7.81	201
5/01	8.01	199
6/01	1.28	201
7/01	0.00	0
8/01	0.00	0
9/01	0.00	0
10/01	1.85	197
11/01	4.02	201

[a]First operational shift reading on November 1, 2001 to first operational shift reading on December 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

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TABLE 5

RE-INJECTION WELL 22240 (IW-11)
OPERATIONAL SUMMARY SHEET
NOVEMBER 2001

Reference Elevation (feet AMSL) - 577.14 (top of casing)
Northing Coordinate ('83) - 476422.82
Easting Coordinate ('83) - 1349386.92

Hours in reporting period[a] = 721.05
Hours not injecting[b] = 382.00
Hours injecting[c] = 339.05
Operational percent[d] = 47.02

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.72	206
1999	7.61	199
2000	6.38	196
1/01	5.97	200
2/01	6.26	199
3/01	7.76	196
4/01	7.68	202
5/01	8.03	201
6/01	6.61	200
7/01	3.91	198
8/01	4.57	195
9/01	3.31	197
10/01	5.39	198
11/01	4.02	198

[a]First operational shift reading on November 1, 2001 to first operational shift reading on December 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

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TABLE 6

RE-INJECTION WELL 22111 (IW-12)
OPERATIONAL SUMMARY SHEET
NOVEMBER 2001

Reference Elevation (feet AMSL) - 583.01 (top of casing)
Northing Coordinate ('83) - 476518.64
Easting Coordinate ('83) - 1350105.39

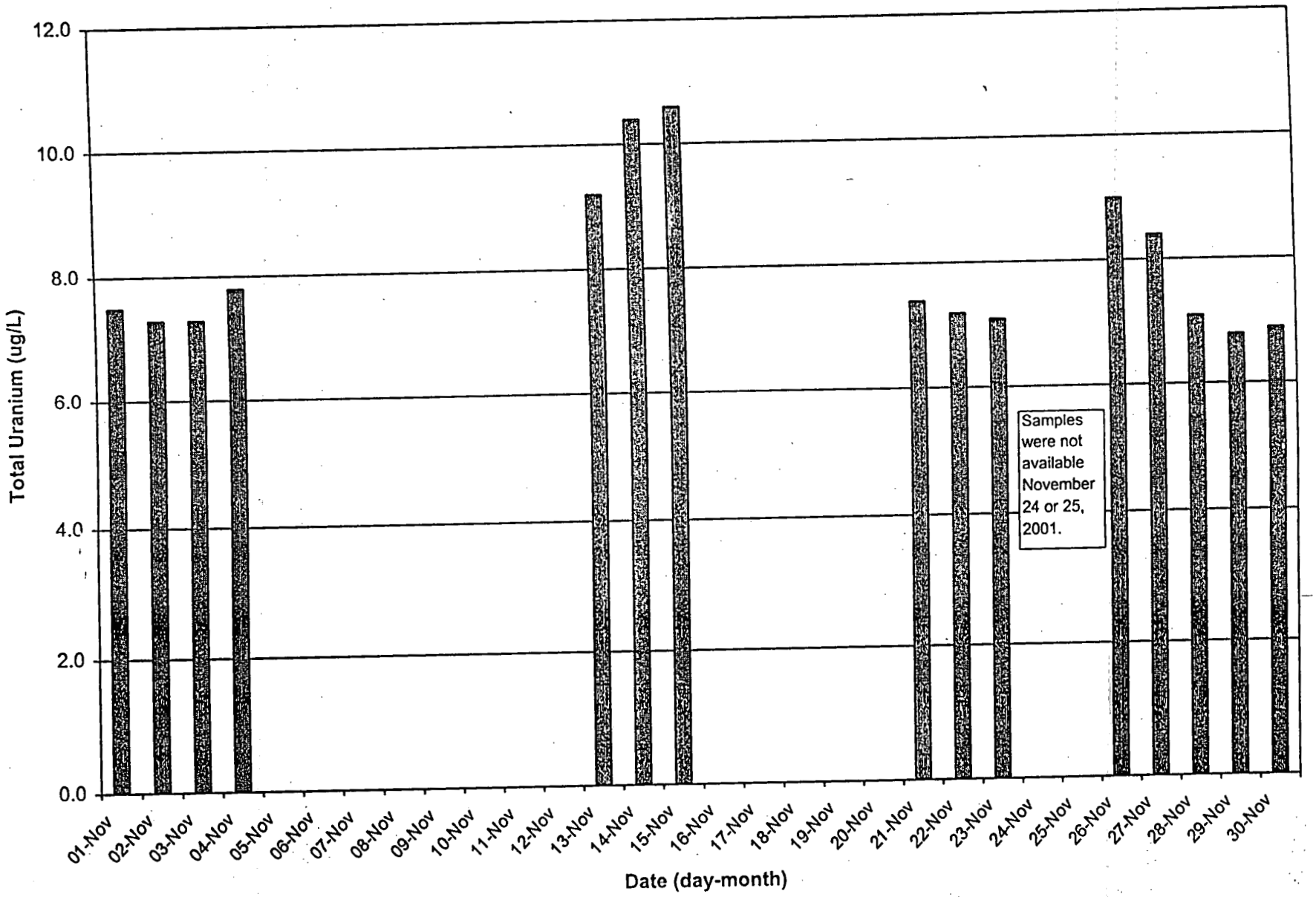
Hours in reporting period[a] = 721.07
Hours not injecting[b] = 388.00
Hours injecting[c] = 333.07
Operational percent[d] = 46.19

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.63	206
1999	7.55	198
2000	6.05	180
1/01	0.00	0
2/01	0.00	0
3/01	0.00	0
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0
8/01	0.00	0
9/01	1.02	150
10/01	6.07	159[h]
11/01	4.00	200

[a]First operational shift reading on November 1, 2001 to first operational shift reading on December 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)
[h]For most of October 2001, the target re-injection rate was 150 gpm.

Figure 1
AWWT Expansion 1800 System Effluent Total Uranium Concentration (µg/L)
on Days when Re-Injection Occurred



Note: Down times are discussed in the text.

nov01 awwt expansion effluent.xls Chart1 01/23/2002 8:04 AM

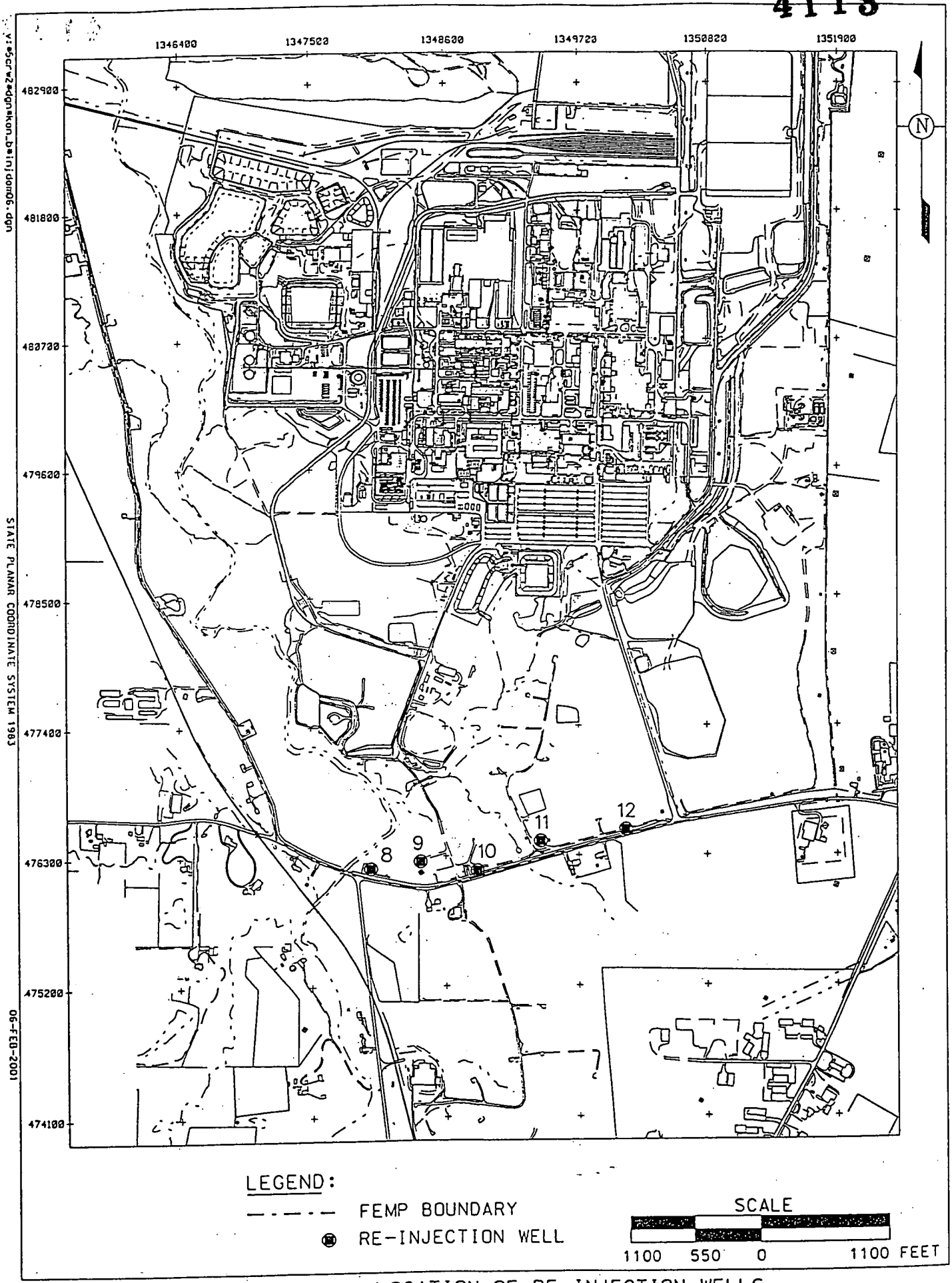
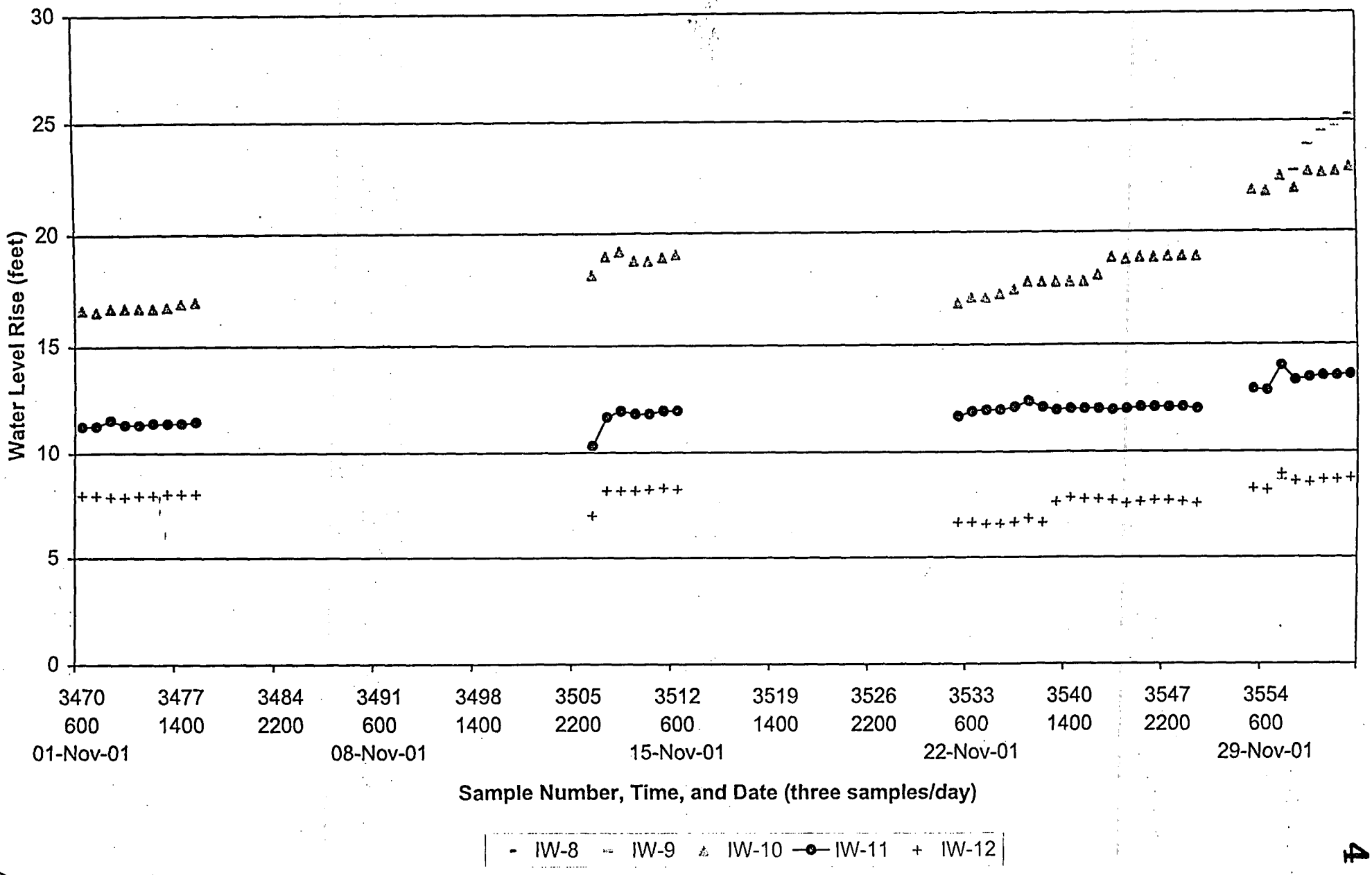


FIGURE 2. LOCATION OF RE-INJECTION WELLS

Figure 3

Re-Injection Wells, Water Level Rise

First Shift on November 1, 2001 (Sample Number 3470) to First Shift on December 1, 2001 (Sample Number 3560)



0111inj-tab.xls Chart2 01/23/2002 8:05 AM